

TRANSMITTAL LETTER TO THE UNITED STATES

0182.00001

DESIGNATED/ELECTED OFFICE (DO/EO/US)

U.S. APPLICATION NO. (IF KNOWN, SEE 37 CFR

CONCERNING A FILING UNDER 35 U.S.C. 371

09/806800

INTERNATIONAL APPLICATION NO.

INTERNATIONAL FILING DATE

PRIORITY DATE CLAIMED

PCT/IB99/01574

23 September 1999

9 October 1998

TITLE OF INVENTION

A WINDSCREEN WIPER

APPLICANT(S) FOR DO/EO/US

Swanepoel

Applicant herewith submits to the United States Designated/Elected Office (DO/EO/US) the following items and other information:

1. ☒ This is a **FIRST** submission of items concerning a filing under 35 U.S.C. 371.
2. ☐ This is a **SECOND** or **SUBSEQUENT** submission of items concerning a filing under 35 U.S.C. 371.
3. ☒ This is an express request to begin national examination procedures (35 U.S.C. 371(f)) at any time rather than delay examination until the expiration of the applicable time limit set in 35 U.S.C. 371(b) and PCT Articles 22 and 39(1).
4. ☒ A proper Demand for International Preliminary Examination was made by the 19th month from the earliest claimed priority date.
5. ☒ A copy of the International Application as filed (35 U.S.C. 371 (c) (2))
 - a. ☐ is transmitted herewith (required only if not transmitted by the International Bureau).
 - b. ☒ has been transmitted by the International Bureau.
 - c. ☐ is not required, as the application was filed in the United States Receiving Office (RO/US).
6. ☐ A translation of the International Application into English (35 U.S.C. 371(c)(2)).
7. ☒ A copy of the International Search Report (PCT/ISA/210).
8. ☒ Amendments to the claims of the International Application under PCT Article 19 (35 U.S.C. 371 (c)(3))
 - a. ☐ are transmitted herewith (required only if not transmitted by the International Bureau).
 - b. ☒ have been transmitted by the International Bureau.
 - c. ☐ have not been made; however, the time limit for making such amendments has NOT expired.
 - d. ☐ have not been made and will not be made.
9. ☐ A translation of the amendments to the claims under PCT Article 19 (35 U.S.C. 371(c)(3)).
10. ☒ An oath or declaration of the inventor(s) (35 U.S.C. 371 (c)(4)).
11. ☒ A copy of the International Preliminary Examination Report (PCT/IPEA/409).
12. ☐ A translation of the annexes to the International Preliminary Examination Report under PCT Article 36 (35 U.S.C. 371 (c)(5)).

Items 13 to 20 below concern document(s) or information included:

13. ☐ An Information Disclosure Statement under 37 CFR 1.97 and 1.98.
14. ☐ An assignment document for recording. A separate cover sheet in compliance with 37 CFR 3.28 and 3.31 is included.
15. ☒ A **FIRST** preliminary amendment.
16. ☐ A **SECOND** or **SUBSEQUENT** preliminary amendment.
17. ☐ A substitute specification.
18. ☐ A change of power of attorney and/or address letter.
19. ☒ Certificate of Mailing by Express Mail
20. ☒ Other items or information:

Postcard

| | | |
|--|--|---|
| U.S. APPLICATION NO. (IF KNOWN, SEE 37 CFR 09/806800) | INTERNATIONAL APPLICATION NO. PCT/IB99/01574 | ATTORNEY'S DOCKET NUMBER 0182.00001 |
|--|--|---|

21. The following fees are submitted:

BASIC NATIONAL FEE (37 CFR 1.492 (a) (1) - (5)) :

| | |
|--|-------------------|
| <input type="checkbox"/> Neither international preliminary examination fee (37 CFR 1.482) nor international search fee (37 CFR 1.445(a)(2)) paid to USPTO and International Search Report not prepared by the EPO or JPO | \$1,000.00 |
| <input checked="" type="checkbox"/> International preliminary examination fee (37 CFR 1.482) not paid to USPTO but International Search Report prepared by the EPO or JPO | \$860.00 |
| <input type="checkbox"/> International preliminary examination fee (37 CFR 1.482) not paid to USPTO but international search fee (37 CFR 1.445(a)(2)) paid to USPTO | \$710.00 |
| <input type="checkbox"/> International preliminary examination fee paid to USPTO (37 CFR 1.482) but all claims did not satisfy provisions of PCT Article 33(1)-(4) | \$690.00 |
| <input type="checkbox"/> International preliminary examination fee paid to USPTO (37 CFR 1.482) and all claims satisfied provisions of PCT Article 33(1)-(4) | \$100.00 |
| ENTER APPROPRIATE BASIC FEE AMOUNT = | \$860.00 |

Surcharge of **\$130.00** for furnishing the oath or declaration later than months from the earliest claimed priority date (37 CFR 1.492 (e)). ☐ 20 ☐ 30 **\$0.00**

| CLAIMS | NUMBER FILED | NUMBER EXTRA | RATE | |
|--|--------------|--------------|-----------|-----------------|
| Total claims | 10 - 20 = | 0 | x \$18.00 | \$0.00 |
| Independent claims | 2 - 3 = | 0 | x \$80.00 | \$0.00 |
| Multiple Dependent Claims (check if applicable). <input type="checkbox"/> | | | | \$0.00 |
| TOTAL OF ABOVE CALCULATIONS = | | | | \$860.00 |
| Reduction of 1/2 for filing by small entity, if applicable. Verified Small Entity Statement (must also be filed (Note 37 CFR 1.9, 1.27, 1.28) (check if applicable)). <input type="checkbox"/> | | | | \$0.00 |
| SUBTOTAL = | | | | \$860.00 |
| Processing fee of \$130.00 for furnishing the English translation later than months from the earliest claimed priority date (37 CFR 1.492 (f)). <input type="checkbox"/> 20 <input type="checkbox"/> 30 + | | | | \$0.00 |
| TOTAL NATIONAL FEE = | | | | \$860.00 |
| Fee for recording the enclosed assignment (37 CFR 1.21(h)). The assignment must be accompanied by an appropriate cover sheet (37 CFR 3.28, 3.31) (check if applicable). <input type="checkbox"/> | | | | \$0.00 |
| TOTAL FEES ENCLOSED = | | | | \$860.00 |
| Amount to be: refunded | | | | \$ |
| charged | | | | \$ |

☒ A check in the amount of **\$860.00** to cover the above fees is enclosed.

☐ Please charge my Deposit Account No. _____ in the amount of _____ to cover the above fees.
A duplicate copy of this sheet is enclosed.

☒ The Commissioner is hereby authorized to charge any fees which may be required, or credit any overpayment to Deposit Account No. **02-2712** A duplicate copy of this sheet is enclosed.

NOTE: Where an appropriate time limit under 37 CFR 1.494 or 1.495 has not been met, a petition to revive (37 CFR 1.137(a) or (b)) must be filed and granted to restore the application to pending status.

SEND ALL CORRESPONDENCE TO:

Gerald E. McGlynn, III
Bliss McGlynn, P.C.
2075 West Big Beaver Rd., Suite 600
Troy, MI 48064

SIGNATURE

Gerald E. McGlynn, III

NAME

33,737

REGISTRATION NUMBER

April 3, 2001

DATE

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant(s): Swanepoel, Adriaan Retief)
Serial No.: Unknown)
Filing Date: April 2, 2001)
For: A WINDSCREEN WIPER)

PRELIMINARY
AMENDMENT

Assistant Commissioner for Patents
Washington, DC 20231

Dear Sir:

Prior to examination, please amend the above-identified application as follows:

IN THE SPECIFICATION:

On page 1, following the title, and before the first paragraph, please insert the following headings:

BACKGROUND OF THE INVENTION

- (1) Field of the Invention

On page 1, line 12, please insert the following heading before the second paragraph on this page:

- (2) Description of the Related Art

09806800-062501

On page 2, line 51 and before the last full paragraph on this page, please insert the following heading:

SUMMARY OF THE INVENTION AND ADVANTAGES

On page 4, line 103, please insert the following new heading:

BRIEF DESCRIPTION OF THE DRAWINGS

On page 5, line 18, please insert the following heading:

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT(S)

IN THE CLAIMS:

Please cancel claim 12.

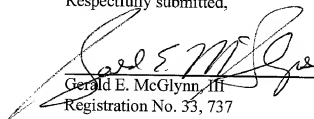
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REMARKS

Claims 1-12 were originally pending in the PCT application to which this application claims priority. On September 20, 2000, in a paper submitted to the International Preliminary Examining Authority at the European Patent Office, claim 11 was cancelled. Claim 12 is an "omnibus" claim and, to the extent that it was not earlier deleted from the application, has been cancelled by way of this Preliminary Amendment. Accordingly, claims 1-10 are presently pending in this application. The specification has been amended to include headings that conform to standard U.S. patent practice. No new matter has been added.

Applicant respectfully submits that the claims clearly distinguish over the prior art and are therefore allowable. Accordingly, applicant respectfully solicits favorable action toward allowance of the claims pending in this case.

Respectfully submitted,


Gerald E. McGlynn, III
Registration No. 33, 737

BLISS McGLYNN, P.C.
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(248) 649-6090

Date: April 3, 2001
Attorney Docket No. 0182.00001

PTO/PCT Rec'd 03 APR 2001

A WINDSCREEN WIPER

10 This invention relates to a windscreen wiper, which is also known as a windshield wiper.

15 The invention relates in particular to a windscreen wiper which has a curved backbone and which may have a varying width and/or thickness. It will be appreciated by those skilled in the art that the backbone may be in the form of a beam that is curved in a plane or may have compound curvature. The beam will then usually have width and thickness dimensions. The beam will also have a radius of curvature at each point along its length.

20 When such a windscreen wiper is pressed onto a surface such as the windscreen (or windshield) of a vehicle, the force intensity (the force per unit length) will vary at different positions along the length of the beam. A large number of factors affect the manner in which the force intensity distribution varies, such as:

25 the material from which the beam is made and the Young's modulus thereof;

the length of the beam;

curvature of the beam;

curvature of the surface;

variation in any one or both of the width of the beam and the thickness

30 of the beam;

the magnitude of the force applied to the beam; and

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the position, or positions, at which the force is applied.

The applicant has found that, with shorter beams, it is adequate to apply the force at a single point. However, with longer beams, ie beams that are longer than about 400mm it is preferable to apply the force to the beam at two spaced apart points. The applicant has further found that the degree of variation of force intensity resulting from changes in curvature of the surface and the magnitude of the force applied to the beam, in use, varies significantly depending on the spacing between the points of application of the force and the ratio between the spacing distance and the total length of the beam.

The applicant has further found that if the spacing between the points exceeds a certain limit, the windscreen wiper will not operate in an efficient manner. There are two main factors which should be taken into account when determining the upper bound of the spacing between the points. Firstly, the vertical clearance between the beam and a force applying member should be taken in to account when, in use, the beam changes from straight to free form and vice versa. Secondly, longitudinal movement of the beam between the force application points should also be considered, when the beam changes from straight to free form and vice versa.

The applicant has conducted substantial analysis in this regard and believes that he has found a relationship between the spacing distance and the total length of the beam and, consequently, between the ratio of spacing distance to total length and length, which provides a windscreen wiper that operates in an improved manner.

According to a first aspect of the invention there is provided a windscreen wiper which includes

an elongate curved backbone which is of a resiliently flexible material; and

a force applying member which is connected to the backbone at two spaced apart points

with the spacing distance S (expressed in millimetres) between the points being between

$$S_1 = 0.1 * L \quad \text{.....} \quad (1)$$

and

$$S_2 = 0.35 * L \quad \text{.....} \quad (2)$$

where the length L is the total length of the backbone expressed in millimetres.

Further according to a second aspect of the invention there is provided a windscreen wiper which includes

an elongate curved backbone which is of a resiliently flexible material; and

a force applying member which is connected to the backbone at two spaced apart points

with the ratio R of spacing distance S between the points and the total length L ($R = S/L$) being between

$$R_1 = 0.1 \quad \text{.....} \quad (3)$$

and

$$R_2 = 0.35 \quad \text{.....} \quad (4)$$

where the spacing distance S and the length L are expressed in the same units of

measure.

The preferred spacing distance S_p between the spaced apart points is about

$$S_p = 0.363 * L - 0.000146 * L^2 \dots\dots\dots (5)$$

and the preferred ratio R_p is about

$$R_p = 0.363 - 0.000146 * L \dots\dots\dots (6)$$

The force applying member may be connected to the backbone in such a manner as to permit relative longitudinal displacement between the force applying member and the backbone.

The curved backbone may have a varying width and or thickness, along its length. The backbone may further have a free form curvature in a plane or may have a compound curvature (that is curved in two planes).

It will be appreciated that the force applying member normally straddles the geometric centre of the backbone. This is particularly so for a windscreen wiper that is intended for use on a driver's side. However, the force applying member may be positioned off-centre for certain cases, such as on passenger side windscreens. In that way the overall performance of the wiper may be optimised.

The invention is now described, by way of example with reference to the accompanying drawings. In the drawings,

Figure 1 shows schematically a windscreen wiper in accordance with the invention;

Figure 2 or Graph A illustrates the beam width at various positions along the length of the beam;

Figure 3 or Graph B illustrates the thickness of the beam at various positions along the length of the beam;

Figure 4 or Graph C shows the beam centre-line coordinate relative to the position along the length of the beam;

Figure 5 or Graph D illustrates the typical clearance required for the beam as a function of spacing distance S; and

Figure 6 or Graph E illustrates the typical amount of longitudinal movement between the beam and the pin when the beam changes shape from curved to straight and vice-versa.

The windscreen wiper 10 includes a backbone 12 which is in the form of a beam. The beam is made from spring steel having a Young's modulus of 205GPa. The length of the beam is 700mm. The beam tapers both in width and thickness from its centre toward its free ends or tips as shown in Graph A and Graph B respectively. Graph A illustrates the beam width (in millimetres) at various positions along the length of the beam, which is also measured in millimetres. Graph B illustrates the thickness of the beam (in millimetres) at various positions along the length of the beam which is also measured in millimetres.

The beam is curved longitudinally, in a plane, with a predetermined radius of curvature at every point along its length. Graph C shows the beam centre-line coordinate relative to the position along the length of the beam (in millimetres).

A force applying member 14 is connected to the beam 12 at two spaced apart points 16 and 18, with a spacing distance S between the points. At the point 16, the force applying member 14 is connected to the beam 12 by means of a pin 20 which is pivotally located in a complementary hole in the beam 12 which does not permit relative longitudinal movement between the beam 12 and the force applying member 14. At the other point 18, the force applying member 14 is connected to the beam 12 by means of a pin 22 which is received in a longitudinal slot 24 in the beam 12 so that relative longitudinal and pivotal movement between the pin 22 and beam 12 is permitted.

It will be appreciated that there needs to be clearance between the force applying member 14 and a line between the points 16 and 18, indicated at 26, in which the section of the beam 12 between the points 16 and 18 can move when the beam changes shape from curved to straight and vice-versa.

Graph D illustrates the typical clearance 26 required for the beam 12 described above as a function of spacing distance S and Graph E illustrates the typical amount of longitudinal movement between the beam 12 and the pin 22 when the beam 12 changes shape from curved to straight and vice-versa.

The spacing S is 150mm. In this case, the ratio R of spacing distance S between the points 16 and 18 and the total length L ($R = S/L$) is therefore 0,214.

CLAIMS:

1. A windscreen wiper which includes

an elongate curved backbone which is of a resiliently flexible material; and

a force applying member which is connected to the backbone at two spaced

apart points

with the spacing distance S (expressed in millimetres) between the points being

between

$$S_1 = 0.1 * L \quad (1)$$

and

$$S_2 = 0.35 * L \quad (2)$$

where the length L is the total length of the backbone expressed in millimetres.

2. A windscreen wiper which includes

an elongate curved backbone which is of a resiliently flexible material; and

a force applying member which is connected to the backbone at two spaced

apart points

with the ratio R of spacing distance S between the points and the total length

L ($R = S/L$) being between

$$R_1 = 0.1 \quad (3)$$

and

$$R_2 = 0.35 \quad (4)$$

where the spacing distance S and the length L are expressed in the same units of measure.

3. The windscreen wiper as claimed in Claim 1, in which the preferred spacing distance S_p between the spaced apart points is about

$$S_p = 0.363 * L - 0.000146 * L^2 \dots\dots\dots (5)$$

4. The windscreen wiper as claimed in Claim 2, in which the preferred ratio R_p is about

$$R_p = 0.363 - 0.000146 * L \dots\dots\dots (6)$$

5. The windscreen wiper as claimed in Claim 1, in which the force applying member is connected to the backbone in such a manner as to permit relative longitudinal displacement between the force applying member and the backbone.

6. The windscreen wiper as claimed in Claim 1, in which the curved backbone has a varying width and thickness, along its length.

7. The windscreen wiper as claimed in Claim 1, in which the curved backbone has a constant thickness along its length.

8. The windscreen wiper as claimed in Claim 1, in which the curved backbone has a constant width along its length.

9. The windscreen wiper as claimed in Claim 1, in which the backbone has a free form curvature in a plane.

10. The windscreen wiper as claimed in Claim 1, in which the backbone has a compound curvature.

11. The windscreen wiper as claimed in Claim 1, in which the force applying member straddles the geometric centre of the backbone.

12. A windscreen wiper substantially as herein described with reference to the accompanying drawing.

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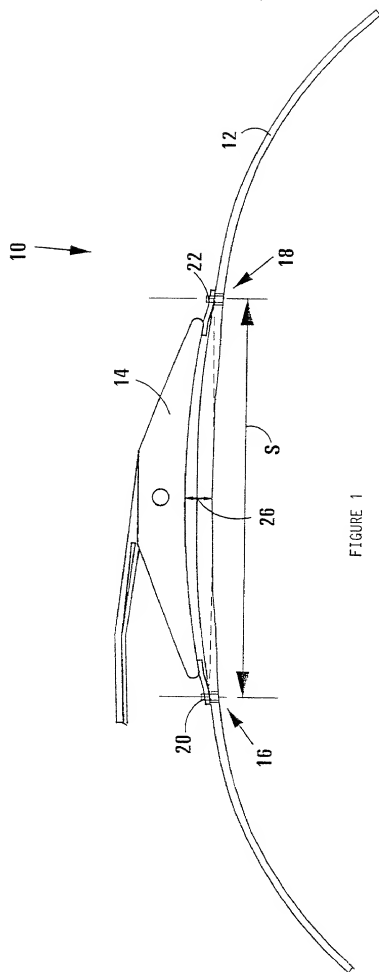
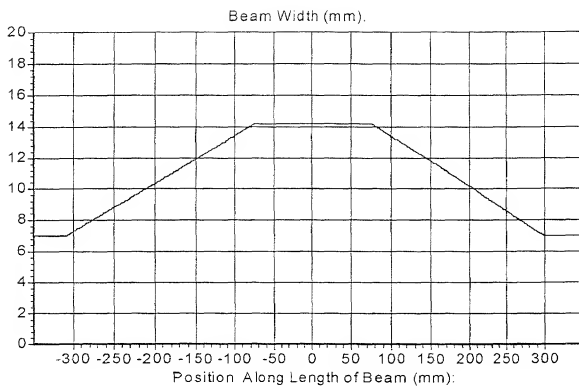
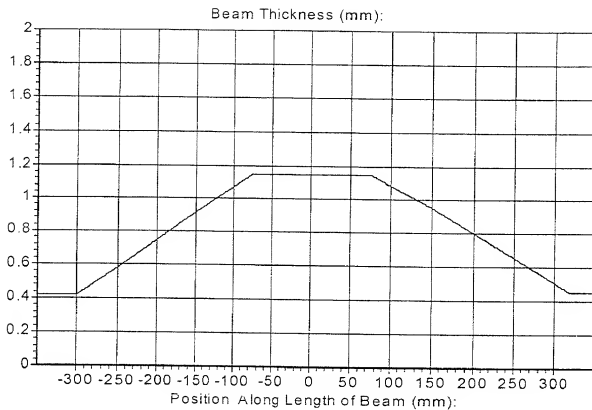


FIGURE 1



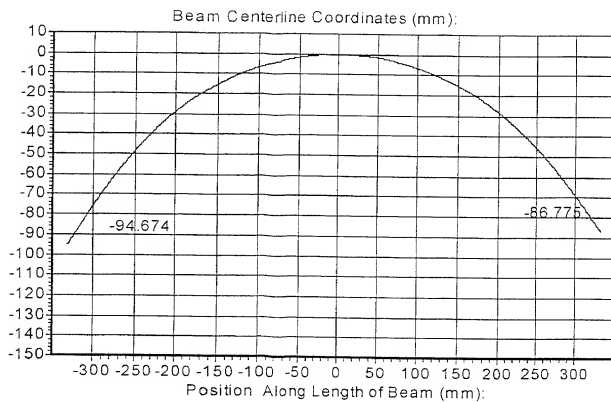
GRAPH A.

FIGURE 2



GRAPH B.

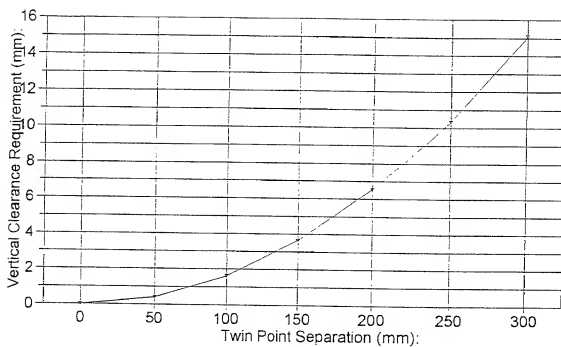
FIGURE 3



GRAPH C.

FIGURE 4

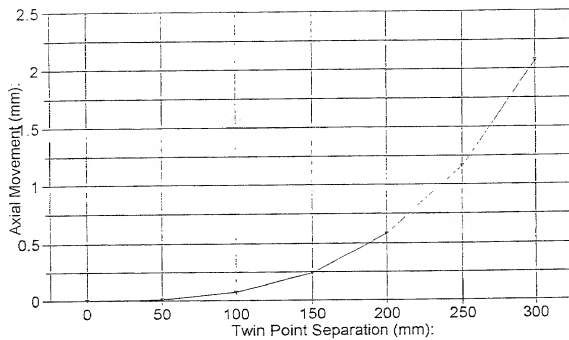
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GRAPH D

FIGURE 5

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GRAPH E

FIGURE 6

Docket No.
0182.00001

Declaration and Power of Attorney For Patent Application

English Language Declaration

As a below named inventor, I hereby declare that:

My residence, post office address and citizenship are as stated below next to my name,

I believe I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled
A WINDSCREEN WIPER

the specification of which

(check one)

☐ is attached hereto.

☒ was filed on 23 September 1999 as United States Application No. or PCT International Application Number PCT/IB99/01574 and was amended on 20 September 2000

(if applicable)

I hereby state that I have reviewed and understand the contents of the above identified specification, including the claims, as amended by any amendment referred to above.

I acknowledge the duty to disclose to the United States Patent and Trademark Office all information known to me to be material to patentability as defined in Title 37, Code of Federal Regulations, Section 1.56.

I hereby claim foreign priority benefits under Title 35, United States Code, Section 119(a)-(d) or Section 365(b) of any foreign application(s) for patent or inventor's certificate, or Section 365(a) of any PCT International application which designated at least one country other than the United States, listed below and have also identified below, by checking the box, any foreign application for patent or inventor's certificate or PCT International application having a filing date before that of the application on which priority is claimed.

Prior Foreign Application(s)

Priority Not Claimed

98/9244

South Africa

9 October 1998

☐

(Number)

(Country)

(Day/Month/Year Filed)

PCT/IB99/01574

PCT

23 September 1999

☐

(Number)

(Country)

(Day/Month/Year Filed)

☐

(Number)

(Country)

(Day/Month/Year Filed)

I hereby claim the benefit under 35 U.S.C. Section 119(e) of any United States provisional application(s) listed below:

(Application Serial No.)

(Filing Date)

(Application Serial No.)

(Filing Date)

(Application Serial No.)

(Filing Date)

I hereby claim the benefit under 35 U. S. C. Section 120 of any United States application(s), or Section 365(c) of any PCT International application designating the United States, listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in the prior United States or PCT International application in the manner provided by the first paragraph of 35 U.S.C. Section 112, I acknowledge the duty to disclose to the United States Patent and Trademark Office all information known to me to be material to patentability as defined in Title 37, C. F. R., Section 1.56 which became available between the filing date of the prior application and the national or PCT International filing date of this application:

(Application Serial No.)

(Filing Date)

(Status)
(patented, pending, abandoned)

(Application Serial No.)

(Filing Date)

(Status)
(patented, pending, abandoned)

(Application Serial No.)

(Filing Date)

(Status)
(patented, pending, abandoned)

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

POWER OF ATTORNEY: As a named inventor, I hereby appoint the following attorney(s) and/or agent(s) to prosecute this application and transact all business in the Patent and Trademark Office connected therewith. (list name and registration number)

Daniel H. Bliss, Reg. No. 32,398

Gerald E. McGlynn, III, Reg. No. 33,737

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| | | |
|-------------------------------------|---|--------------------|
| Full name of sole or first inventor | <u>Adriaan Retief Swanepeel</u> | Date |
| Sole or first inventor's signature | <u>Swanepeel</u> | <u>30 Apr 2001</u> |
| Residence | <u>Pretoria, Republic of South Africa</u> | |
| Citizenship | <u>South Africa</u> | |
| Post Office Address | <u>309 Aries Street, Waterkloof Ridge, 0181, Pretoria, Republic of South Africa</u> | |

| | |
|--------------------------------------|------|
| Full name of second inventor, if any | |
| Second inventor's signature | Date |
| Residence | |
| Citizenship | |
| Post Office Address | |